

## LESSON

## 6.5

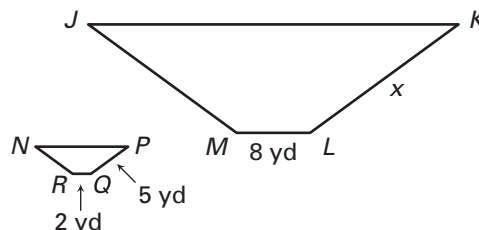
Name \_\_\_\_\_ Date \_\_\_\_\_

**Study Guide**

For use with pages 293–297

**GOAL** Find unknown side lengths of similar figures.**EXAMPLE 1** Finding an Unknown Side Length in Similar FiguresGiven  $JKLM \sim NPQR$ , find  $KL$ .**Solution**

Use the ratios of the lengths of corresponding sides to write a proportion involving the unknown length,  $KL$ .



$$\frac{LM}{QR} = \frac{KL}{PQ}$$

Write proportion involving  $KL$ .

$$\frac{8}{2} = \frac{x}{5}$$

Substitute.

$$8 \cdot 5 = 2x$$

Cross products property

$$40 = 2x$$

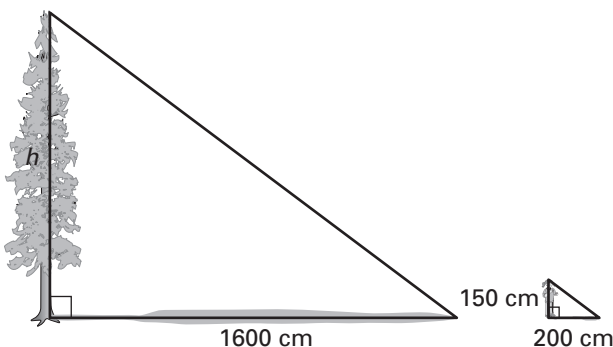
Multiply.

$$20 = x$$

Divide each side by 2.

**Answer:** The length of  $\overline{KL}$  is 20 yards.**EXAMPLE 2** Using Indirect Measurement

A girl who is 150 centimeters tall is standing next to a tree. The tree and the girl are perpendicular to the ground. The sun's rays strike the tree and the girl at the same angle, forming two similar triangles. The length of the girl's shadow is 200 centimeters, and the length of the tree's shadow is 1600 centimeters. How tall is the tree?

**Solution**

Write and solve a proportion to find the height  $h$  (in centimeters) of the tree.

$$\frac{\text{Height of tree}}{\text{Height of girl}} = \frac{\text{Length of tree's shadow}}{\text{Length of girl's shadow}}$$

$$\frac{h}{150} = \frac{1600}{200}$$

Substitute.

$$200h = 150 \cdot 1600$$

Cross products property

$$200h = 240,000$$

Multiply.

$$h = 1200$$

Divide each side by 200.

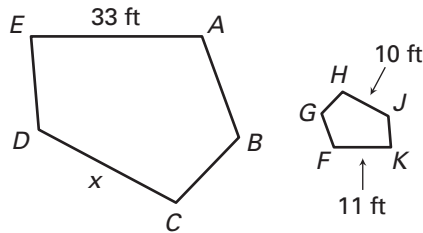
**Answer:** The height of the tree is 1200 centimeters, or 12 meters.

# Study Guide

For use with pages 293–297

## Exercises for Examples 1 and 2

1. Given  $ABCDE \sim FGHJK$ , find  $CD$ .



2. A 4-foot boy is standing next to a statue. The shadow cast by the boy is 3 feet and the shadow cast by the statue is 30 feet. What is the statue's height?

## EXAMPLE 3 Using Algebra and Similar Triangles

Given  $\triangle JKL \sim \triangle JMN$ , find  $JN$ .

To find  $JN$ , write and solve a proportion.

$$\frac{KL}{MN} = \frac{JL}{JN}$$

Write proportion.

$$\frac{KL}{MN} = \frac{JN + NL}{JN}$$

Use the fact that  $JL = JN + NL$ .

$$\frac{10}{5} = \frac{x + 6}{x}$$

Substitute.

$$10x = 5(x + 6)$$

Cross products property

$$10x = 5x + 30$$

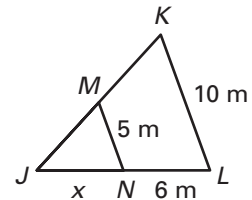
Distributive property

$$5x = 30$$

Subtract  $5x$  from each side.

$$x = 6$$

Divide each side by 5.



**Answer:** The length of  $\overline{JN}$  is 6 meters.

## Exercise for Example 3

3. Given  $\triangle STU \sim \triangle SYZ$ , find  $ZU$ .

